Electronic Version
Stylesheet Version v1.1.1

Claims

[c1] 1. An redundant array of independent disks (RAID) storage device, comprising L number of virtual disks having a plurality of stripes with each strip having a plurality of blocks, wherein a number of the blocks in each stripe is equal to a number of the virtual disks, and a block index, assigned to each block, the RAID storage device comprising:
M number of storage devices comprising a plurality of blocks, wherein, M, L are positive integers, M > L, and M is not multiple of L, when the blocks of the virtual disks are distributed in the storage devices, a "position index" is assigned to the block in each storage device, and the position index is a mapping function of the block index.

[c2] 2. The RAID storage device of claim 1, wherein the storage devices comprises a plurality of physical disks.

[c3] 3. A redundant array of independent disks (RAID) storage device, comprising:
M number of storage devices each comprising N number of storage blocks, and the storage blocks of the same J-column in the storage devices comprising:
a plurality of complete stripe blocks, each comprising L

number of storage blocks, wherein, N, M, L are positive integers, L < M, and M is not multiple of L; and
at least a plurality partially complete stripe blocks.

[c4] 4. The RAID storage device of claim 3, wherein each stripe block comprises at least a first physical data block and at least a first parity data block, and the first parity data block is obtained from the calculation based on the first physical data block.

[c5] 5. The RAID storage device of claim 3, wherein the partially complete stripe blocks comprises at least a second physical data block.

[c6] 6. The RAID storage device of claim 3, wherein the partially complete stripe blocks comprises at least a second parity data block.

[c7] 7. The RAID storage device of claim 3, wherein the storage devices comprises a plurality of physical disks.

[c8] 8. A redundant array of independent disks (RAID) storage device, comprising:
M number of storage devices, each comprising N number of storage blocks, and the storage blocks of the same J-column in the storage devices comprising:
a plurality of complete stripe blocks comprising L number of first physical data blocks, wherein, M, N, J are

positive integers, J is a positive integer of 1 ~ N, L < M, and M is not multiple of L; and
at least a plurality partially complete stripe blocks.

[c9] 9. The RAID storage device of claim 8, wherein the partially complete stripe blocks comprises at least a second physical data block.

[c10] 10. The RAID storage device of claim 8, wherein the storage devices comprises a plurality of physical disks.